CLAIMS

I claim:

[c1] An air provision system for providing ambient air to a portable power module trailerable over public roads, the portable power module including a shipping container defining a first interior portion toward a first direction and a second interior portion toward a second direction opposite to the first direction, the air provision system comprising:

a first air circuit including a first air inlet positioned on the container to provide an ambient first air portion to the first interior portion at least substantially to the exclusion of the second interior portion, the portable power module including a gaseous fuel motor positioned within the first interior portion, the gaseous fuel motor having a combustion chamber and a coolant jacket positioned adjacent to the combustion chamber to circulate liquid coolant, the portable power module including an electrical power generator positioned within the first interior portion and drivably connected to the gaseous fuel motor to produce electrical power; and

a second air circuit including a second air inlet positioned on the container to provide an ambient second air portion to the second interior portion at least substantially to the exclusion of the first interior portion, the portable power module further including a radiator positioned within the second interior portion in flow communication with the coolant jacket to receive the coolant from the coolant jacket and return the coolant to the coolant jacket.

[c2] The air provision system of claim 1 wherein the first and second air inlets are positioned on the container having an overall length dimension of about

40 feet or less, an overall width dimension of about 8 feet or less, and an overall height dimension of about 8.5 feet or less.

[c3] The air provision system of claim 1 wherein the gaseous fuel motor includes a combustion air intake in flow communication with the combustion chamber, wherein the first air circuit is configured to provide a fraction of the first air portion to the combustion air intake, and wherein the combustion chamber is configured to combust a fuel mixture comprising natural gas and the fraction of the first air portion.

[c4] The air provision system of claim 1 wherein the generator is capable of producing at least approximately one megawatt of electrical power at a selected motor speed and includes a generator air intake configured to receive cooling air, and wherein the first air circuit is configured to provide a fraction of the first air portion to the generator air intake.

[c5] The air provision system of claim 1 wherein the container includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, and wherein:

the first air inlet is positioned adjacent to one of the first or second side portions adjacent to the first interior portion;

the first air circuit further includes a first air outlet positioned adjacent to the top portion to vertically discharge at least a fraction of the first air portion from the first interior portion away from the container;

the second air inlet is positioned adjacent to one of the first or second side portions adjacent to the second interior portion; and

the second air circuit further includes a second air outlet positioned adjacent to the top portion to discharge at least a fraction of the second air portion from the second interior portion away from the container.

[c6] The air provision system of claim 1 wherein the container includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, wherein the portable power module further includes an exhaust gas silencer positioned within the container and having an exhaust gas outlet positioned adjacent to the top portion, the exhaust gas silencer connected in flow communication with the combustion chamber and configured to receive exhaust gases from the combustion chamber and vertically discharge the exhaust gases through the exhaust gas outlet away from the container, and wherein:

the first air inlet is positioned adjacent to one of the first or second side portions adjacent to the first interior portion;

the first air circuit further includes a first air outlet positioned adjacent to the top portion to vertically discharge at least a fraction of the first air portion from the first interior portion away from the container;

the second air inlet is positioned adjacent to one of the first or second side portions adjacent to the second interior portion; and

the second air circuit further includes a second air outlet positioned adjacent to the top portion to vertically discharge at least a fraction of the second air portion from the second interior portion away from the container, the exhaust gas outlet being spaced apart from the second air outlet to define a space therebetween on the top portion of the container, wherein the first air outlet is positioned in the space between the exhaust gas outlet and the second air outlet.

[c7] The air provision system of claim 1 wherein the container includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, wherein the portable power module further includes an exhaust gas silencer positioned within the container and having an exhaust gas outlet positioned adjacent to the top portion, the exhaust gas silencer connected in flow communication with the combustion

chamber and configured to receive exhaust gases from the combustion chamber and vertically discharge the exhaust gases through the exhaust gas outlet away from the container, and wherein:

the first air inlet is positioned adjacent to one of the first or second side portions adjacent to the first interior portion;

the first air circuit further includes an air outlet silencer proximally positioned adjacent to the exhaust gas silencer within the container, the air outlet silencer having a first air outlet positioned adjacent to the top portion to vertically discharge at least a fraction of the first air portion from the first interior portion away from the container;

the second air inlet is positioned adjacent to one of the first or second side portions adjacent to the second interior portion; and

the second air circuit further includes a second air outlet positioned adjacent to the top portion to vertically discharge at least a fraction of the second air portion from the second interior portion away from the container.

[c8] The air provision system of claim 1 wherein the container includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, wherein the portable power module further includes an exhaust gas silencer positioned within the container and having an exhaust gas outlet positioned adjacent to the top portion, the exhaust gas silencer connected in flow communication with the combustion chamber and configured to receive exhaust gases from the combustion chamber and vertically discharge the exhaust gases through the exhaust gas outlet away from the container, and wherein:

the first air inlet is positioned adjacent to one of the first or second side portions adjacent to the first interior portion;

the first air circuit further includes an air outlet silencer proximally positioned adjacent to the exhaust gas silencer within the container,

the air outlet silencer having a first air outlet positioned adjacent to the top portion, the first air circuit further including a first air moving system, the first air moving system including a first fan positioned in flow communication with the air outlet silencer to vertically discharge at least a fraction of the first air portion from the first interior portion through the first air outlet away from the container;

the second air inlet is positioned adjacent to one of the first or second side portions adjacent to the second interior portion; and

the second air circuit further includes a second air outlet positioned adjacent to the top portion and a second air moving system, the second air moving system including a second fan in flow communication with the second air outlet to vertically discharge at least a fraction of the second air portion from the second interior portion through the second air outlet away from the container.

[c9] The air provision system of claim 1 wherein the container includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, wherein the radiator is at least substantially horizontally situated in the second interior portion of the container, wherein the second air inlet is positioned adjacent to one of the first or second side portions adjacent to a lower part of the second interior portion and the radiator.

[c10] The air provision system of claim 9 wherein the second air circuit further includes:

an air outlet positioned adjacent to the top portion; and

a fan horizontally situated above the radiator in flow communication with the second air outlet to vertically discharge at least a fraction of the second air portion from the second interior portion through the second air outlet away from the container.

[c11] The air provision system of claim 1 wherein the container includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, wherein the radiator is at least substantially horizontally situated in the second interior portion of the container, wherein the second air inlet is positioned adjacent to one of the first or second side portions adjacent to a lower part of the second interior portion the radiator, and wherein the second air circuit further includes:

an air outlet positioned adjacent to the top portion;

a fan horizontally situated above the radiator in flow communication with the second air outlet to vertically discharge at least a fraction of the second air portion from the second interior portion through the second air outlet away from the container; and

an occluding member carried by the top portion adjacent to the second air outlet, the occluding member being selectively positionable between a closed position at least partially occluding the second air outlet and a substantially open position at least partially exposing the second air outlet.

[c12] The air provision system of claim 11 wherein the occluding member is selectively pivotable between a lowered position at least partially occluding the second air outlet and an elevated position at least partially exposing the second air outlet.

[c13] The air provision system of claim 1 wherein the container includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, wherein the first air inlet is positioned adjacent to one of the first or second side portions adjacent to the first interior portion, and wherein the first air circuit further includes:

an air inlet duct having a body positionable within the first interior portion in flow communication with the first air inlet at least partially defining a

first opening parallel to the first direction and a second opening at an angle to the first direction; and

an air outlet positioned adjacent to the top portion to vertically discharge at least a fraction of the first air portion from the first interior portion away from the container.

[c14] The air provision system of claim 1 wherein the container includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, wherein the first air inlet is positioned adjacent to one of the first or second side portions adjacent to the first interior portion, and wherein the first air circuit further includes:

an air inlet duct having a body positionable within the first interior portion in flow communication with the first air inlet at least partially defining a first opening parallel to the first direction and a second opening at an angle to the first direction, the body further defining an overall first body dimension perpendicular to the first direction and an overall second body dimension parallel to the first direction, the first body dimension being less than the second body dimension; and

an air outlet positioned adjacent to the top portion to vertically discharge at least a fraction of the first air portion from the first interior portion away from the container.

[c15] The air provision system of claim 1 wherein the container includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, wherein the first air inlet is positioned adjacent to one of the first or second side portions adjacent to the first interior portion, and wherein the first air circuit further comprises:

an air inlet duct, the air inlet duct including:

a body positionable within the first interior portion in flow communication with the first air inlet at least partially defining

a first opening parallel to the first direction and a second opening at an angle to the first direction, the body further defining an overall first body dimension perpendicular to the first direction and an overall second body dimension parallel to the first direction, the first body dimension being less than the second body dimension;

acoustic insulation fixidly attached to the body; and

a flow splitter having an elongate cross-section oriented parallel to the first direction and disposed adjacent to the second opening; and

an air outlet positioned adjacent to the top portion to vertically discharge at least a fraction of the first air portion from the first interior portion away from the container.

[c16] A portable power module trailerable over public roads, the portable power module comprising:

a shipping container including a first side portion spaced apart from an opposing second side portion and a bottom portion spaced apart from an opposing top portion, the bottom and top portions being connected to the first and second side portions to at least partially define a first interior portion toward a first direction and a second interior portion toward a second direction opposite to the first direction;

a gaseous fuel motor positioned within the first interior portion, the gaseous fuel motor including a combustion chamber and a coolant jacket positioned adjacent to the combustion chamber to circulate liquid coolant;

an electrical power generator positioned within the first interior portion and drivably connected to the motor to produce at least one megawatt of

electrical power when driven by the motor at a selected speed in a normal operating configuration;

a radiator positioned within the second interior portion in flow communication with the coolant jacket, the radiator configured to receive the coolant from the coolant jacket and return the coolant to the coolant jacket;

a first air circuit including a first air inlet positioned on the container adjacent to the first interior portion to provide an ambient first air portion to the first interior portion at least substantially to the exclusion of the second interior portion, the first air circuit further including a first air outlet positioned on the container to discharge at least a fraction of the first air portion away from the container; and

a second air circuit including a second air inlet positioned on the container adjacent to the second interior portion to provide an ambient second air portion to the second interior portion at least substantially to the exclusion of the first interior portion, the second air circuit further including a second air outlet positioned on the container to discharge at least a fraction of the second air portion away from the container.

[c17] The portable power module of claim 16 wherein:

the first air inlet is positioned adjacent to one of the first or second side portions; and

the second air inlet is positioned adjacent to one of the first or second side portions.

[c18] The portable power module of claim 16 wherein:

the first air outlet is positioned adjacent to the top portion of the container to vertically discharge at least a fraction of the first air portion away from the container; and

the second air outlet is positioned adjacent to the top portion of the container to vertically discharge at least a fraction of the second air portion away from the container.

[c19] The portable power module of claim 16 wherein:

the first air inlet is positioned adjacent to one of the first or second side portions;

the second air inlet is positioned adjacent to one of the first or second side portions;

the first air outlet is positioned adjacent to the top portion of the container to vertically discharge at least a fraction of the first air portion away from the container; and

the second air outlet is positioned adjacent to the top portion of the container to vertically discharge at least a fraction of the second air portion away from the container.

[c20] The portable power module of claim 16 wherein the gaseous fuel motor includes a combustion air intake in flow communication with the combustion chamber and the generator includes a generator air intake configured to receive cooling air, and wherein the first air portion provides ambient air to the combustion air intake and the generator air intake, and wherein the second air portion provides ambient air adjacent to the radiator to cool the coolant received from the coolant jacket.

[c21] The portable power module of claim 16 further comprising an exhaust gas silencer positioned within the container and having an exhaust gas outlet positioned adjacent to the top portion of the container, the exhaust gas silencer connected in flow communication with the combustion chamber and configured to receive exhaust gases from the combustion chamber and vertically

discharge the exhaust gases through the exhaust gas outlet away from the container.

[c22] The portable power module of claim 16 further comprising an exhaust gas silencer positioned within the container and having an exhaust gas outlet positioned adjacent to the top portion of the container, the exhaust gas silencer connected in flow communication with the combustion chamber and configured to receive exhaust gases from the combustion chamber and vertically discharge the exhaust gases through the exhaust gas outlet away from the container, the exhaust gas outlet being spaced apart from the second air outlet to define a space therebetween on the top portion of the container, wherein the first air outlet is positioned in the space between the exhaust gas outlet and the second air outlet.

[c23] The portable power module of claim 16 further comprising:

a first air moving system, the first air moving system including a first fan positioned in flow communication with the first air outlet to move at least a fraction of the first air portion from the first interior portion through the first air outlet and away from the container; and

a second air moving system, the second air moving system including a second fan in flow communication with the second air outlet to move at least a fraction of the second air portion from the second interior portion, past the radiator, through the second air outlet and away from the container.

[c24] The portable power module of claim 16 wherein the first air outlet is positioned adjacent to the top portion of the container to vertically discharge at least a fraction of the first air portion away from the container, wherein the second air outlet is positioned adjacent to the top portion of the container to vertically

discharge at least a fraction of the second air portion away from the container, and wherein the portable power module further comprises:

a first air moving system, the first air moving system including a first fan positioned in flow communication with the first air outlet to move at least a fraction of the first air portion from the first interior portion through the first air outlet and away from the container; and

a second air moving system, the second air moving system including a horizontally situated second fan in flow communication with the second air outlet to move at least a fraction of the second air portion from the second interior portion, past the radiator, through the second air outlet and away from the container.

[c25] The portable power module of claim 16 further comprising an air inlet duct having a body positionable within the first interior portion in flow communication with the first air inlet at least partially defining a first opening parallel to the first direction and a second opening at an angle to the first direction.

[c26] The portable power module of claim 16 further comprising an air inlet duct having a body positionable within the first interior portion in flow communication with the first air inlet at least partially defining a first opening parallel to the first direction and a second opening at an angle to the first direction, the body further defining an overall first body dimension perpendicular to the first direction and an overall second body dimension parallel to the first direction, the first body dimension being less than the second body dimension.

[c27] The portable power module of claim 16 further comprising an air inlet duct having a body positionable within the first interior portion in flow communication with the first air inlet at least partially defining a first opening parallel to the first direction and a second opening perpendicular to the first

direction, the body further defining an overall first body dimension perpendicular to the first direction and an overall second body dimension parallel to the first direction, the first body dimension ranging from approximately 1- 2 feet and the second body dimension ranging from approximately 3-4 feet.

[c28] The portable power module of claim 16 further comprising an air inlet duct, the air inlet duct including:

a body positionable within the first interior portion in flow communication with the first air inlet at least partially defining a first opening parallel to the first direction and a second opening at an angle to the first direction, the body further defining an overall first body dimension perpendicular to the first direction and an overall second body dimension parallel to the first direction, the first body dimension being less than the second body dimension;

acoustic insulation fixidly attached to the body; and

a flow splitter having an elongate cross-section oriented parallel to the first direction and disposed adjacent to the second opening.

[c29] The portable power module of claim 16 wherein the container has an overall length dimension of about 40 feet or less, an overall width dimension of about 8 feet or less, and an overall height dimension of about 8.5 feet or less.

[c30] The portable power module of claim 16 wherein the container is a standard 40-foot shipping container.

[c31] The portable power module of claim 16 wherein the combustion chamber is configured to combust a fuel mixture comprising natural gas.

[c32] The portable power module of claim 16 wherein the generator produces at least approximately one megawatt of electrical power ranging from

approximately 50Hz to 60Hz when driven by the motor at a speed ranging from approximately 1500 to 1800 RPM.

[c33] The portable power module of claim 16 further comprising a trailer supporting the container and its contents, the trailer having a tandem axle rear wheel-set and a forward coupling, the coupling being releasably attachable to a transport vehicle for movement of the portable power module over public roads.

[c34] A method for providing ambient air to a portable power module, the portable power module including a shipping container and a gaseous fuel motor drivably connected to an electrical power generator for producing electrical power, the gaseous fuel motor having a combustion chamber and a coolant jacket positioned adjacent to the combustion chamber to circulate liquid coolant, the portable power module further including a radiator in flow communication with the coolant jacket to receive the coolant from the coolant jacket and return the coolant to the coolant jacket, the method for providing ambient air to the portable power module comprising:

partitioning the container into a first interior portion toward a first direction and a second interior portion toward a second direction opposite to the first direction;

positioning the gaseous fuel motor and the generator in the first interior portion;

positioning the radiator in the second interior portion;

providing a first air inlet on the container adjacent to the first interior portion to provide an ambient first air portion to the motor and the generator in the first interior portion at least substantially to the exclusion of the second interior portion;

providing a first air outlet on the container to discharge at least a fraction of the first air portion from the first interior portion away from the container;

providing a second air inlet on the container adjacent to the second interior portion to provide an ambient second air portion to the radiator in the second interior portion at least substantially to the exclusion of the first interior portion; and

providing a second air outlet on the container to discharge at least a fraction of the second air portion from the second interior portion away from the container.

[c35] The method of claim 34 wherein the container further includes a first side portion spaced apart from an opposing second side portion, and wherein:

providing the first air inlet includes providing the first air inlet on one of the first side portion or the second side portion adjacent to the first interior portion; and

providing the second air inlet includes providing the second air inlet on one of the first side portion or the second side portion adjacent to the second interior portion.

[c36] The method of claim 34 wherein the container further includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, and wherein:

providing the first air outlet includes providing the first air outlet adjacent to the top portion to vertically discharge at least a fraction of the first air portion from the first interior portion away from the container; and

providing the second air outlet includes providing the second air outlet adjacent to the top portion to vertically discharge at least a fraction of the second air portion from the second interior portion away from the container.

[c37] The method of claim 34 wherein the container further includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, and wherein:

providing the first air inlet includes providing the first air inlet adjacent to one of the first side portion or the second side portion adjacent to the first interior portion;

providing the first air outlet includes providing the first air outlet adjacent to the top portion to vertically discharge at least a fraction of the first air portion from the first interior portion away from the container;

providing the second air inlet includes providing the second air inlet adjacent to one of the first side portion or the second side portion adjacent to the second interior portion; and

providing the second air outlet includes providing the second air outlet adjacent to the top portion to vertically discharge at least a fraction of the second air portion from the second interior portion away from the container.

[c38] The method of claim 34 wherein the container further includes a first side portion spaced apart from an opposing second side portion and a top portion connected to the first and second side portions, wherein:

positioning the radiator includes horizontally situating the radiator in the second interior portion of the container;

providing the second air inlet includes providing the second air inlet adjacent to one of the first side portion or the second side portion adjacent to the second interior portion and below the radiator;

providing the second air outlet includes providing the second air outlet adjacent to the top portion to vertically discharge at least a fraction of the second air portion from the second interior portion away from the container; and wherein the method further comprises:

horizontally situating a fan above the radiator in flow communication with the second air outlet to vertically discharge at least a fraction of the second air portion from the second interior portion through the second air outlet away from the container.

[c39] The method of claim 34 further comprising positioning an air inlet duct within the first interior portion in flow communication with the first air inlet at least partially defining a first opening parallel to the first direction and a second opening at an angle to the first direction, the air inlet duct including a body defining an overall first body dimension perpendicular to the first direction and an overall second body dimension parallel to the first direction, the first body dimension being less than the second body dimension.

[c40] A method for providing ambient air to a portable power module, the portable power module including a shipping container having a first interior portion toward a first direction and a second interior portion toward a second direction opposite to the first direction, the portable power module including a gaseous fuel motor drivably connected to an electrical power generator for producing electrical power, the gaseous fuel motor having a combustion chamber and a coolant jacket positioned adjacent to the combustion chamber to circulate liquid coolant, the portable power module further including a radiator in flow communication with the coolant jacket to receive the coolant from the coolant jacket and return the coolant to the coolant jacket, the method for providing ambient air to the portable power module comprising:

providing an ambient first air portion to the motor and the generator at least substantially to the exclusion of the radiator, the motor and the generator being positioned in the first interior portion; and

providing an ambient second air portion to the radiator at least substantially to the exclusion of the motor and the generator, the radiator being positioned in the second interior portion.

[c41] The method of claim 40 further comprising:

vertically discharging at least a fraction of the first air portion away from the container; and

vertically discharging at least a fraction of the second air portion away from the container.